PATENT SPECIFICATION

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DRAWINGS ATTACHED.
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COMPLETE SPECIFICATION.

Improved Gasket.

We, RICHARD KLINGER LIMITED, of Klingerit Works, Sidcup, Kent, a British Company, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to gaskets for use in joining together in sealed relation two parts each having a conduit for a gas or liquid in such a way that gas or liquid passing from one part to the other is prevented from escaping at the joint.

The invention is particularly applicable to cases in which the jointing gasket has to provide a seal for hot gases, oils, water or mixtures thereof under vibratory and/or fluctuating shock conditions. One of the problems in such cases is to maintain a sealed condition after the seal has been made.

The usual form of mechanical seal for a hot gas joint is in the form of a metal binding around the hot gas chamber and attached to a compressed asbestos fibre sheeting said binding overlapping the edge of the compressed asbestos fibre sheet. This metal binding, has too slow a rate of recovery resilience when used between rapidly vibrating faces, to keep pace with the mating face separation and closure to form a continual sealing pressure under all conditions.

According to the present invention there is provided a gasket having an opening for the passage of a gas or liquid, the said gasket consisting of compressed asbestos fibre bonded and formed into a sheet in which said opening is formed, said opening being lined with a metal binding annulus of 'U'-shaped cross section the ends of which embrace the margin of the sheet, wherein a resilient member is positioned within the 'U'-section binding annulus between the edge of the sheet and the bottom of the 'U', said resilient member being of channel-shaped cross section. The channel shaped cross-section may be "U" shaped or "C" shaped and the "C" may be substantially closed or the ends may overlap but do not seal with each other to form a tube. Said resilient member may be made of metal. Two or more such resilient members may be used within the 'U' section binding.

Referring to the drawings accompanying the Provisional Specification:—

Fig. 1 is a diagrammatic section through an opening in a fragment of one form of gasket made in accordance with the present invention;

Fig. 2 is a similar view of a modified form of the invention;

Fig. 3 is a section through a modified resilient member;

Figs. 4 to 6 are similar sectional views of modified forms of gaskets made in accordance with the invention; and

Figs. 7 and 8 show sectional views of further modified forms of the invention.

In the form shown in Fig. 1 the gasket consists of a sheet 2 of compressed fibre bonded sheeting which, of course, is cut to the required shape and is pierced with the requisite number of openings correctly positioned to register with the passages in the two parts to be joined. For the purpose of this example it will be assumed that the gasket in question, of which only a fragment is shown in section, is a cylinder head gasket for an internal combustion engine and that the opening to be sealed is at the top of the cylinder above which is of course the cylinder head bounding the combustion

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chamber. This opening 4 is encircled by a metal binding 6 of U-shaped cross-section in the form of a rim of metal overlapping and bonded to the edges of the compressed asbestos fibre sheet, but leaving an annular space 8 between the edge of the compressed asbestos fibre sheet and the bottom 10 of the 'U' in which is positioned a resilient member 12 of channel shaped section substantially filling said annular space. The channel shaped section in this embodiment is 'U' shaped. The gasket is shown clamped between a cylinder block 14 and a cylinder head 16.

In the modified form shown in Fig. 2 the resilient member consists of two rings 18 of bent arcuate form i.e. slightly curved to the shape of a shallow 'C' and with the concave faces pointing to the bottom of the 'U' of the metal binding 6.

Fig. 3 shows a resilient member 20 of snail shape section which can be used to replace the resilient member 12 or members 18 shown in Figs. 1 and 2 respectively. In this form the edges of the section overlap slightly and touch but are not joined or sealed so that a closed tube is not formed.

Fig. 4 shows an arrangement similar to that shown in Fig. 1 but in which there are two binding rings 6 and 6^1 and two resilient channel shaped members 12 and 12^1 respectively of 'U' shape as in Fig. 1, which in each case may have different stiffness and may be made of different metals.

Fig. 5 shows an arrangement similar to that illustrated in Fig. 1 but with two resilient channel shaped members 12 of 'U' shape arranged back to back.

Fig. 6 shows a channel shaped resilient member of 'C' shape, the 'C' with the concave face pointing to the bottom of the 'U' of the metal binding 6. This provides less resilience than either of the embodiments shown in Fig. 1 or Fig. 2.

In the form shown in Fig. 7 two resilient members 12 and 12^1 are of 'C' shape channel section arranged one within the other and lying on their backs with the ends of the 'C' bent in and almost meeting. In Fig. 8 there are two channel shaped resilient members 12 and 12^1 of 'U' section arranged one within the other as in Fig. 4 but turned on their side so that the ends lie in the plane of the sheet 2 and oriented in the direction as the binding 6.

Numerous other modifications will suggest themselves to the reader for example the sheeting may incorporate a central metal sheet in which case this can be continued to the bottom of the 'U' and pass between two resilient members arranged as in Fig. 5.

With a gasket made in accordance with any of the arrangements described above the elasticity of the resilient member is used to maintain a sealing pressure between the surfaces after they have been clamped together.

Jointless metal rings in any one of the several sections illustrated can be produced commercially in large number at a reasonable cost and may even be obtainable on the open market.

According to the purpose for which the gasket is required so will the choice of a suitable metal for the binding rim and the resilient member be varied, for example, for low temperatures and pressures the binding may be of copper whereas for high temperatures a stainless steel heat resistant alloy would be used. Likewise, with the resilient member the choice must rest with a metal which will provide the desired resilience under the conditions to which it will be subjected and, in fact, it is to be considered that for some purposes the resilient member may be formed in a plastic material provided that it has the requisite physical characteristics to stand up to the conditions for which it is required. Consequently the use of plastics is not excluded for certain purposes even today and the plastics industry has made such rapid strides that plastics are already known having remarkable heat resistant properties which might eventually prove to be a suitable substitute for metal.

WHAT WE CLAIM IS:—

1. A gasket having an opening for the passage of a gas or liquid, the said gasket consisting of compressed asbestos fibre bonded and formed into a sheet in which said opening is formed, said opening being lined with a metal binding annulus of 'U'-shaped cross section the ends of which embrace the margin of the sheet, wherein a resilient member is positioned within the 'U'-section binding annulus between the edge of the sheet and the bottom of the 'U', said resilient member being of channel-shaped cross section.

2. A gasket according to claim 1 wherein two or more resilient members are positioned within the 'U'-section binding annulus.

3. A gasket according to claim 1 or 2 wherein the arms of the or each said channel-shaped resilient member touch but are not joined.

4. A gasket according to any one of the preceding claims 1 to 3 wherein the or each said resilient channel-shaped member is of shallow C shaped cross section.

5. A gasket constructed and arranged substantially as described with reference to and as illustrated in Fig. 1 of the drawings accompanying the Provisional Specification.

6. A gasket constructed and arranged substantially as described with reference to and as illustrated in Fig. 2 of the drawings accompanying the Provisional Specification.

7. A gasket constructed and arranged substantially as described with reference to and as illustrated in Fig. 1 modified by having a resilient member constructed as illustrated in Fig. 3 of the drawings accompanying the Provisional Specification.

8. A gasket constructed and arranged substantially as described with reference to and as illustrated in Fig. 4 of the drawings accompanying the Provisional Specification.

9. A gasket constructed and arranged substantially as described with reference to and as illustrated in Fig. 5 of the drawings accompanying the Provisional Specification.

10. A gasket constructed and arranged substantially as described with reference to and as illustrated in Fig. 6 of the drawings accompanying the Provisional Specification.

11. A gasket constructed and arranged substantially as described with reference to and as illustrated in Fig. 7 of the drawings accompanying the Provisional Specification.

12. A gasket constructed and arranged substantially as described with reference to and as illustrated in Fig. 8 of the drawings accompanying the Provisional Specification.

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1 SHEET This drawing is a reproduction of the Original on a reduced scale

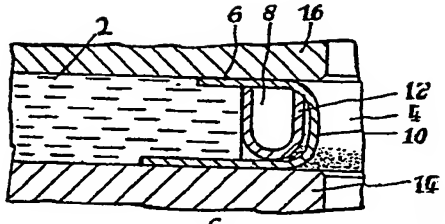

Fig. 1.

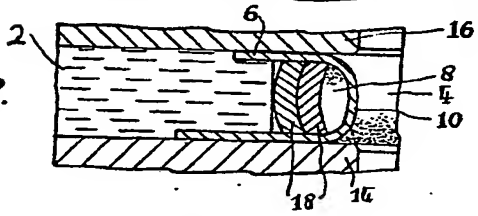

Fig. 2.

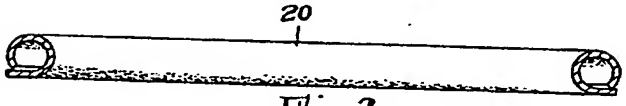

Fig. 3.

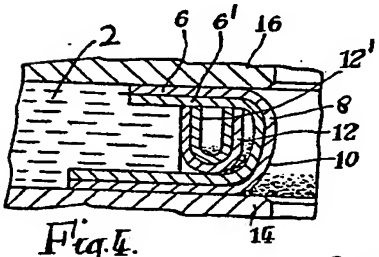

Fig. 4.

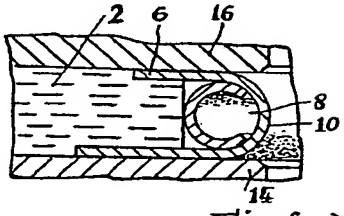

Fig. 6.

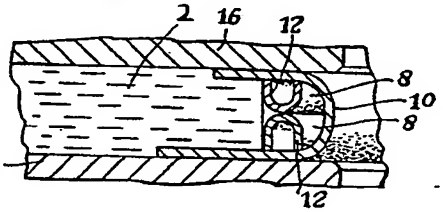

Fig. 5.

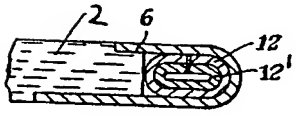

Fig. 7.

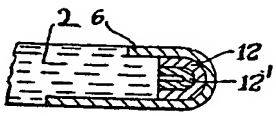

Fig. 8.